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A COLLECTING TRIP NORTH OF SAULT STE. MARIE, ONTARIO.

E. B. WILLIAMSON.

This little trip of two weeks' duration was made especially in search of dragonflies along the line of the Algoma Central Railroad north of Sault Ste. Marie, Ontario. Every effort was made to collect the greatest possible number of specimens and species in this group, and the other records of animals and of plants which follow are based upon the most desultory collecting. Those who have studied these miscellaneous collections have furnished me with notes which are published in this paper over the authors' names.

The Algoma Central Railroad is one of the Clurg enterprises. Aimed across a wilderness at the distant Hudson Bay, it was to be the highway over which the golden fleece should be brought to the Soo. The power of the rapids of the St. Marys River, the mines and forests of the Algoma District, a railroad route to Hudson Bay, homes for settlers, these were the things which the creative imagination of a man saw as material for the building of a great and flourishing empire from which he and his associates should receive wealth hitherto undreamed of. But the workmen came down from the mountains for their long due pay and troops protected the officers of the several companies. The Algoma Central has been built for only 70 miles. These 70 miles are, however, well constructed and a trestle at Bellevue is said to be the highest and longest wooden structure of this kind in the world.

At once after leaving the Soo the road passes into mountains which are uninterrupted from that point to the inland terminus. Cuts through solid rock reveal beautiful folds of the pink and dark green layers of gneiss or the more uniform black, gray or

pink of a granitic mass. Near the track one may see a precipitous cliff, bold, rough, scarred and menacing, or some rounded and smooth knob with the steep sides bared of vegetation by forest fires. Great beds of stratified gravel and sand are exposed by railroad cuts and by the action of the streams. At several places a very tough, light blue, laminated clay was seen. In some cases streams flowed over this clay; in other cases it was in banks above the stream bed. This clay is very resistant to the action of water and is extremely slippery where water is flowing over it. Where broken down in large masses by stream undermining and subsequently subjected to erosion at varying angles from time to time, the exposed laminations often form beautiful patterns.

The railroad after a short distance north of the Soo to a point north of Heyden is in the drainage area of the Root River, a tributary of the St. Marys River below the Soo. Before reaching Searchmont, 30 miles north of the Soo, the road crosses tributaries of the Goulais River, and from here to its northern terminus it is in Lake Superior drainage.

The vegetation which clothes these granite masses is "hardwood brush." The view from the railroad of the Goulais valley, bounded by its great vari-green mountains is most beautiful. On a following page are lists of the arboreal species and of the plants which I collected.

The short summer of this region results in a condensation of seasonal range of the species of any group which depend on abundant light and heat for their activity. For example, on July 30th, I saw *Iris*, a "spring flower," and *Solidago*, an "autumn flower," in bloom literally side by side. Of dragonflies I took *Chromagrion conditum* and *Aeshna* Z. (see list of dragonflies following) about the same lake on the same day. On that day at latitude 42 degrees north in Indiana *Chromagrion* had probably entirely disappeared for the season and *Aeshna* if it had yet appeared at all, would certainly be found in very limited numbers. This condensation is greatly to the advantage of the collector, at least in certain groups. Possibly for a short trip no better season than the first half of August could be chosen for collecting in this region. About the first of August the black flies have nearly disappeared, and I was but little bothered by these pests or by mosquitoes or sand flies. It is probable I failed to get certain *Cordulines* and *Gomphines* which may be on the wing in this region earlier in the season, but on the whole I believe I took a fair representation of the species. At my home at Bluffton, Indiana, no two weeks of the season (April 1st to Nov. 21st) could be selected which would yield so nearly all the species of that locality.

Collections were made at the following points along the Algoma Central. On July 29th and 30th, a little collecting was done about the Soo, and on July 30th I arrived at Heyden, about thirteen miles from the Soo. While at Heyden I lived with Mr. William Marshall who is operating a shingle mill there. The afternoon of July 30th was spent along Mud Lake, near the shore of which Heyden is situated, along a similar lake just above Mud Lake, and along the small marshy stream connecting the two lakes. July 31st a wagon trail west of Heyden was followed for about two miles to a beaver dam on a small stream; this stream was followed to its mouth in Root River, and Root River was followed down stream to where it is crossed by the railroad. August 2d was spent along Root River below the point where the railroad crosses it and at the stony ripple just above this point. On August 3d and 4th Stony Lake was visited. This is a beautiful body of water lying in the hills high above and to the east of Mud Lake, into which it discharges its overflow. I was told at Heyden that the name was local as the lake does not appear on any maps of the district. The precipitous shores of this appropriately named lake made exploration difficult and almost fruitless or dragonflyless. The greater portion of the two days was spent about the lower, pond-like, end of the lake, where a dam, constructed by Perry for getting out pine, still holds the lake above its natural level. About this portion of the lake dragonflies fairly swarmed—usually out of reach of the collector. August 1st was spent along the Goulais River above Searchmont, and at the mouth of Achigan Brook. August 5th was spent along the Algoma Central as far as the inland terminus. Rain and cloudy weather prevailed during the entire day and no dragonflies were collected. August 6th was spent along Achigan Brook for several miles above Searchmont. Achigan Brook flows from Spruce Lake. It is known also as Spruce Creek and Little Goulais. I have never followed a more beautiful stream than this. Long, precipitous rapids, where great broken masses of rock impede the water, flinging it into a myriad of rainbows, alternate with serene slow-flowing pools, now broad, now narrow, in sunshine and shade. On August 7th I went on the tote-road to the third dam on Perry Brook, several miles from Searchmont, and followed this stream till its clear waters mingled with the yellowish waters of the swift flowing Goulais. Along Perry Brook are great exposures of the clay mentioned above and of sand banks. August 8th was again spent along Achigan Brook several miles above Searchmont. On August 9th I walked south on the railroad three or four miles to where the railroad crosses Dam Creek. Dam Creek was explored for about a mile above the railroad and below the railroad to its mouth in the Goulais River. On my return trip home I stopped

at Oden, Crooked Lake, Michigan, with my uncle, G. T. Williamson, and August 11th and 12th, were spent collecting there. Later my cousin, Jesse H. Williamson, caught a few specimens about Oden. These records are mentioned in the lists which follow.

No birds or mammals were collected. The white-throated sparrows by their numbers and song were the conspicuous members of the avifauna. A small and exceedingly bold Buteo was frequently seen and heard. At lonely lakes, otherwise devoid of bird life, loons signaled my approach with their weird cries. Kingfishers rattled their displeasure or surprise at my intrusion along their streams. Flocks of cross-bills* by their habits of flight and voice recalled the flocks of small parrots frequently seen in Central America. And in every thicket were numerous warblers unidentifiable to me without field glass or gun. About every lake and stream were innumerable dainty prints of deer's hoofs, with occasionally the ox-like spoor of the moose. Though an insect collector has small chance of surprising large game three fawns were seen. Beaver dams are common on the streams. On Dam Creek, in a distance of less than a quarter of a mile were three small newly constructed dams, built largely of yellow birch. Mr. J. L. Naylor of Searchmont told me that fisher, otter, mink and all the other furbearing animals of interior Canada are taken along the Algoma Central.

The following list of trees and bushes growing in the vicinity of Searchmont has been prepared for me by Mr. Naylor: Pine, white, Jack and Norway, the last very scarce; spruce; balsam; tamarack; white cedar; hard maple; white birch; yellow (or red or black) birch; ironwood; popple or balm of gilead; red oak, very scarce; hemlock, very scarce; soft elm; cherry, very scarce; black ash; mountain ash; tag alder; elder (red berried); red currant; black currant; hazel; wild rose; two species of willow; choke cherries; ground hemlock; gooseberry; dogwood; raspberries; blackberries; blue berries.

PLANTS DETERMINED BY C. C. DEAM OF BLUFFTON, INDIANA.

Species preceded by a star (*) were taken at Searchmont, from August 6th to 10th. The other species were taken at Hayden, from July 31st to August 4th:

<i>Pteridium aquilinum</i> (L.) Kuhn.	<i>Potamogeton nuttallii</i> Cham. &
<i>Lycopodium lucidulum</i> Michx.	Sch.
<i>L. obscurum</i> L.	<i>Sporobolus asperifolius</i> (N. & M.)
<i>Sparganium angrocladum</i>	Hurb.
(Engelm.) Morong.	<i>Panicularia canadensis</i> (Michx.)
* <i>S. simplex</i> Huds.	Kuntze.

*From my description of size, colors and habits, Mr. W. E. C. Todd has so determined them.

- Scirpus cyperinus* (L.) Kunth.
Eriophorum polystachyon L.
Rhynchospora alba (L.) Vahl.
Carex abacta Bailey.
C. oligosperma Michx.
 **C. retrorsa* Schwein.
C. rostrata Stokes.
C. stellulata Gooden.
C. crawfordii Fernald
C. scoparia Schk.
Eriocaulon septenangulare With.
 **Juncus nodosus* L.
J. canadensis brevicaudata Engl.
Streptopus amplexicaulis (L.) DC.
Pogonia ophiogloisoides (L.) Ker.
Peramium ophiodes (Fernald) Rydb.
Brasenia purpurea (Michx.) Casp.
Castalia odorata (Dryand) W. & W.
Coptis trifolia (L.) Salisb.
Erysimum cheiranthoides L.
Drosera intermedia Hayne.
Amelanchier oligocarpa R. & S.
Illicoides mucronata (L.) Britton.
Hypericum ellipticum Hook.
- Triadenum virginicum* (L.) Raf.
Cornus canadensis L.
Monotropa uniflora L.
Chamaenerion angustifolium (L.) Scop.
Lysimachia terrestris (L.) B. S. P.
Apocynum androsaemifolium L.
Scutellaria galericulata L.
Utricularia cornuta Michx.
 **Viburnum opulus* L.
Solidago rugosa Mill.
S. canadensis L.
Euthamia hirtella Greene.
Aster macrophyllus L. var. *velutines* Burgess.
 **A. puniceus* L.
A. nemoralis Ait.
 **Doellingeria umbellata pubens* (A. Gray) Britton.
Anaphalis margaritacea (L.) B. & H.
Achillea millefolium L.
Chrysanthemum leucanthemum L.
 **Carduus muticus* (Michx.) Pers.
 **C. arvensis* (L.) Robs.

BIVALVES.

At Heyden one species of bivalve was collected in the small stream connecting Mud Lake and the lake just above Mud Lake. Specimens were sent to the U. S. Nat. Museum and Mr. Rathbun reports that they have been determined as *Anodonta marginata* Say.

CRAYFISHES.

The crayfish collected on the trip were sent to Dr. A. E. Ortmann who furnishes the following report on them:

1. *Cambarus propinquus* Gir. Localities: Crooked Lake, Emmett County, Mich.; St. Marys River, Sault Ste. Marie; Algoma District, Inlet of Mud Lake, Heyden; Dam Creek, Searchmont.

The specimens are all typical.

Distribution: Drainage of Mississippi and lower Ohio, and of Great Lakes and St. Lawrence; in eastern Iowa, Illinois, Indiana, southern Wisconsin, Michigan, northern Ohio, north-western Pennsylvania, western and northern New York, and eastern Ontario (Toronto) and Quebec (Montreal). Up to the present time the last named locality (Montreal) and Oden, Emmett Co., Michigan, marked the most northern expansion of the range aside from the vague record "Lake Superior" given by Hagen (according to L. Agassiz). The present localities from the eastern extremity of Lake Superior (vicinity of Sault

Ste. Marie) tend to confirm this old record, although it has yet to be demonstrated that the species is found in Lake Superior proper.

2. *Cambarus virilis* Hagen. Locality: Crooked Lake, Oden, Emmett County, Michigan.

Distribution: Abundant in the Mississippi and Missouri drainage from northern Texas, Arkansas and Oklahoma, through Kansas, Missouri, eastern Nebraska, Iowa and western Illinois to Michigan and Minnesota. In the latter states, also in northern Indiana, it is found in the drainage of the Great Lakes. In northern Minnesota and north Dakota it has invaded the drainage of the Red River of the North, and goes through Winnipeg as far north as Saskatchewan (Hagen). It is also found in eastern Ontario, and the drainage of the lower lakes and the St. Lawrence, but not on the United States side: Toronto (Faxon); Sandy Lake, Peterborough County (Ortmann) and there is a fine series of this species in the Carnegie Museum from the new locality: Rideau River, Billings Bridge, Ottawa. This latter locality, Emmett Co., Michigan, and Lake Superior in Minnesota (Herrick) mark the northern boundary of this species in the Lake region. The absence of this species in the whole of the Ohio drainage is remarkable.

3. *Cambarus bartonii* (F.). Locality: Dam Creek, Searchmont, Algoma District, Ontario, Canada (region of eastern end of Lake Superior).

The specimens at hand agree in all essential points with the typical form of *C. bartonii* as found in Pennsylvania; and also in minor points there is not the slightest difference; there is no approach whatever to *C. bartonii robustus* (Gir.).

Distribution: *C. bartonii* belongs to the Appalachian System, ranging from Tennessee and North Carolina to Maine and New Brunswick. Its northwestern boundary is formed by the St. Lawrence River and the lower lakes, it never having been reported, with one exception, to the north of this line. This only exception is near Lake St. John, in Quebec, for to the northeast of the range in the States of Ohio and Indiana this species does not reach the Lake region and it has never been found in any part of Ontario, Michigan and Wisconsin.

Indeed Hagen gives, upon the authority of L. Agassiz: Lake Superior, a record that has been dropped by Ortmann (Trans. Am. Phil. Soc. 44 '05, p. 135). The present locality, however, confirms this old record, at least in so far as this species is positively found in the Lake Superior region. Nevertheless this locality appears strange since it is so far remote from the rest of the range, the nearest place, in western New York, being about 400 miles away. In the intervening region in eastern Ontario,

this species has not been found, although the variety *robustus* (Gir.) is found at Toronto and westward in tributaries of Lake Ontario.

Of course there must be a connection of our new locality with the main range of the species. It may go along the northern shore of Lake Huron and through eastern Ontario, but particulars are wanting. A connection through Michigan I think is out of the question, since this state as well as northern Indiana and northern Ohio are rather well known, so that we may safely affirm that it is missing in this region. Eastern Ontario is very poorly known. Thus this species should be searched for in Ontario and possibly also in southern Quebec.

One male, first form, two males, second form, and eight females of this species were taken under rocks in rapids in Dam Creek on August 9th. The specimens agree in size with specimens of the species from eastern Pennsylvania. One female was carrying recently hatched young. One male of *C. propinquus* was taken at the same place.

REPTILES AND BATRACHIANS.

But few reptiles were seen. The single turtle taken was the only one seen in Canada, and only two garter snakes were seen in the Algoma District, and one of these escaped. Frogs were exceedingly numerous at certain localities. *Rana catesbiana* was very common at the lower end of Stony Lake where many could have been captured easily as they made but little effort to escape. The specimens collected were given to Dr. Atkinson who has prepared the following notes:

1. *Rana pipiens* Schieber. Leopard Frog. This species is represented in the collection by five specimens, collected at Heyden, Ontario, Canada. They are all small adults, the coloration of which is close to that described as *Rana virescens brachycephala* by Cope, having no longitudinal band on the femur and having the tibial cross bars complete, also yellow bordered dorsal spots. However, the head is longer than in typical specimens of the variety *brachycephala*, and the muzzle is as acuminate as in most specimens of the variety *R. p. pipiens* and the size of the spots correspond with the latter variety. The measurements in meters are as follows:

Length of head and body.....	.0464 to .0550
Length of head to posterior edge of tympanum.....	.0160 to .0195
Width of head at posterior edge of tympanum.....	.0155 to .0195
Diameter of tympanum.....	.0035 to .0045
Diameter of eye.....	.0050 to .0055
Length of tibia.....	.0255 to .0315
Length of femur.....	.0220 to .0260
Length of foot.....	.0260 to .0315

2. *Rana palustris* Le Conte. Pickerel Frog. There was one specimen of this species in the collection. It was taken at Heyden, Ontario, Canada, and differs in no way from western Pennsylvania specimens of this species. The measurements in meters are as follows:

Length of head and body.....	.0585
Length of head to posterior edge of tympanum.....	.0195
Width of head at posterior edge of tympanum.....	.0205
Diameter of tympanum.....	.0045
Diameter of eye.....	.0055
Length of tibia.....	.0340
Length of femur.....	.0295
Length of foot and tarsus.....	.0250

3. *Rana septentrionalis* Baird. There were four specimens of this frog, all taken at Heyden, Ontario. Three are males and one a female. Measurements in meters:

Specimen No.	Lg. of head & body	Lg. of femur	Lg. of tibia	Lg. of ft. and tarsus	Eye	Tympanum	Width of head
No. 1 male...	.0655	.0315	.0345	.0350	.0070	.0080	.0245
No. 2 male...	.0635	.0315	.0330	.0355	.0070	.0075	.0240
No. 3 male...	.0665	.0305	.0335	.0355	.0075	.0100	.0260
No. 4 female..	.0700	.0305	.0340	.0360	.0075	.0060	.0255

No. 1 has a very pale coloration; the vermiculations are scarcely visible; snout obtuse; no cross bars on the hind legs.

No. 2 has a very dark coloration; markings indistinct; snout medium obtuse; faint cross bars on the hind legs.

No. 3 has a bright coloration; markings distinct and of small pattern; snout sharply pointed; distinct cross bars on hind legs.

No. 4 has bright coloration; markings large and distinct; snout sharply pointed; distinct cross bars on the hind legs.

The coloration of these four specimens varies greatly, also the size of the tympanum and form of snout.

The skin of the back is smooth anteriorly, but becomes rough and tuberculated posteriorly and on the sides; belly entirely smooth. Cope says "The present distribution of the species is entirely northern" and he includes it in a list of batrachia typical of the Canadian fauna. It has been taken in the upper Michigan Peninsula, and the writer took it at Vanceboro, Maine, during May, 1901, where it was abundant.

4. *Rana catesbiana* Shaw. Bull Frog. There was one small adult and two young of this species in the collection. The coloration of these specimens is dark, but not more so than some Pennsylvania specimens, neither is the dorsal surface more nodular.

MEASUREMENTS IN METERS.	1. JUV.	2. JUV.	ADULT
Length of head and body.....	.0360	.0830	.1115
Width of head.....	.0145	.0330	.0485
Length of femur.....	.0165	.0415	.0485
Length of tibia.....	.0125	.0420	.0545
Length of foot and tarsus.....	.0200	.0470	.0590
Diameter of eye.....	.0040	.0090	.0105
Diameter of tympanum.....	.0035	.0090	.0105
Length of fore-arm.....	.0075	.0190	.0245

5. *Rana sylvatica* LeConte. Wood Frog. The single specimen of this species in the collection was taken at Searchmont, Ontario, Canada, August 8, 1906. In this specimen the heel just reaches the anterior border of the orbit and the leg bars are very faint, two points in the direction of *Rana cantabrigensis*. However, it has as well developed an outer metatarsal tubercle as most specimens of *Rana sylvatica*, and the webbing on the feet and general coloration is that of this species. It is tuberculated posteriorly on the back, but smooth in front; below it is finely granulated to the abdominal and pubic regions; no light line along the thighs and two phalanges of the 4th toe free.

MEASUREMENTS IN METERS.

Length of head and body.....	.0505
Width of head.....	.0165
Length of femur.....	.0240
Length of tibia.....	.0245
Length of foot.....	.0250
Diameter of eye.....	.0050
Diameter of tympanum.....	.0035

6. *Bufo lentiginosus americanus* Le Conte. Common Toad. One specimen of this species collected at Heyden, Ontario, Canada, August, 1906. It is a typical *B. l. americanus* of dark coloration.

MEASUREMENTS IN METERS.

Length of head and body.....	.0810
Width of head.....	.0325
Length of femur.....	.0350
Length of tibia.....	.0320
Length of tarsus.....	.0200
Diameter of tympanum.....	.0065
Diameter of eye.....	.0085
Length of leg.....	.1025

7. *Eutaenia sirtalis* Linn. Garter Snake. There were two specimens of this species; one (No. 16) from Searchmont, Ontario, Canada; collected August 8, 1906, and one (No. 17) from Oden, Michigan collected August 12, 1906. The Oden specimen is a typical *E. sirtalis sirtalis* in coloration; the Searchmont specimen is of the olive-green type of coloration that is found so commonly in the mountain region of Pennsylvania; light green dorsal stripe covering median dorsal row and half of each row on either side; a dark olive green stripe on either side extend-

ing to the third row of scales from the ventral plates; a light green stripe occupying the first three rows above the ventrals. Belly yellowish green, with faint spots on the ends of the gastrosteges.

MEASUREMENTS IN METERS.

Length (body and tail).....	.5450	.5100
Length of tail.....	.1300	.1250
Upper labials.....	7	7
Lower labials.....	10 symmetrical	10 non-symmetrical
Gastrosteges.....	154	149
Sub-caudals.....	74 pairs	79 pairs

8. *Clemmys insculptus* Le Conte. Wood Turtle. One large specimen of this species collected at Searchmont, Ontario, Canada; August 8, 1906. The jaw is more prominently toothed than usual in this species; male measurements:

Length of carapace.....	.2120
Width of carapace.....	.1525
Length of head.....	.0545
Width of head.....	.0375

ORTHOPTERA.

In so far as special attention was given to dragonflies I have reserved the final place in this paper for considering them. The few insects of other orders collected will be listed first.

The Orthoptera, determined by W. S. Blatchley.

1. *Circotettix verruculatis* (Kirby). Heyden, July 31st, 1 pair; Searchmont, August 6th and 8th, 3 males.
2. *Melanoplus bivittatus* (Say). Searchmont, August 7th, 1 male.
3. *Melanoplus atlantis* (Riley). Heyden, July 31st, male; Searchmont, August 6th and 7th, 1 male, 2 females.
4. *Melanoplus femur-rubrum* (DeG.). Searchmont, August 7th, 1 female.
5. *Melanoplus extremus* (Walker). Stony Lake, Heyden, August 3d, 2 males, 1 female.
6. *Stenobothrus curtippennis* (Harris). Searchmont, August 6th, 1 female.

The six species are known to occur in southern Canada and also all but *Circotettix verruculatis* occur in Indiana.

HEMIPTERA.

Where the overflow from Stony Lake descends rapidly to Mud Lake the course of the small stream is a succession of water falls and steep and high walled pools. In one of these dark pools a number of water skippers were collected. They were sent to Mr. J. R. de le Torre Bueno who has determined them as *Gerris remigis* Say, adults and nymphs. The other Hemiptera were sent to Professor H. Osborn, who names them as follows:

Ceresa melanogaster Osb., Searchmont.
Lepyronia 4-angularis Say, Searchmont.
Philaronia abjecta Uhl., Searchmont.
Diedrocephala coccinea Forst., Searchmont.
Helochara communis Fh., Heyden.
Draculaecephala mollipes Say, Searchmont.
Draculaecephala manitobiana Ball, Oden, Mich.
Gypona octolineata Say, Searchmont.
Thamnotettix melanogaster Prov., Oden, Mich.
Phlepsius apertus Van D., Heyden and Searchmont.
Platymetopius acutus Say, Searchmont.
 Searchmont.

BUTTERFLIES.

So little time was spent away from the immediate vicinity of lakes and streams (in fact most of my time was spent *in* the lakes and streams) that the number taken of such conspicuous insects as butterflies is not large. These were sent to Mr. J. L. Graf of Pittsburg.

Anosia plexippus L., Searchmont, Hayden; one specimen seen but not taken.
Argynnis atlantis Edwards, Searchmont, Hayden.
Argynnis cybele Fab., Heyden, three females; one of these was submitted to Dr. Skinner. See *Entomological News*, Vol. 4, 1893, p. 318.
Brenthis myrina Cramer, Searchmont, Hayden.
Pyrameis atalanta Linnaeus, Searchmont, one seen but not taken.
Grapta faunus Edwards, Searchmont, Hayden.
Vanessa J-album Boisduval and Leconte, Searchmont, Hayden.
Vanessa milberti Godart, Searchmont.
Vanessa antiopa Linnaeus, Searchmont.
Basilarchia arthemis Drury, Hayden.
Pieris napi form virginiensis Edwards, Searchmont.
Colias eurytheme Bdv., Searchmont.

DIPTERA.

The Diptera, exclusive of Syrphidae, were sent to Professor Jas. S. Hine and the Syrphidae were sent to Professor R. C. Osburn. Their lists follow:

The following eighteen species of Diptera are all well known, with the exception of what I have called *Laphria terraenovae*. Macquart described this species from specimens taken in Newfoundland and it appears that it has not been recognized since. His description is very short and consequently it is with some doubt that the specimens before me are given the name, but the points mentioned agree so well that I know of no good reason why they might not be of the species in question.

The collection contains the finest series of *Chrysops excitans* Walker that I have ever seen. This species is not rare, but its habitat is in such high latitudes that specimens are not often taken. Over twenty specimens were taken at Heyden, Ontario, August 6th.

Physocephala furcillata Williston is a notable species of the family Conopidae. It appears to be strictly northern in its distribution.

• It is interesting to note that just half of the species have blood-sucking females, while at least four are parasitic and two are predaceous.

Following is a full list of species exclusive of the Syrphidae:

Simulium venustum Say, Heyden.
Stratiomyia badius Walker, Searchmont.
Chrysops carbonarius Walker, Searchmont.
Chrysops excitans Walker, Heyden.
Chrysops frigidus Osten Sacken, Searchmont.
Chrysops niger Macquart, Heyden.
Chrysops striatus Osten Sacken, Oden, Michigan.
Tabanus microcephalus Osten Sacken, Heyden.
Tabanus nivosus Oster Sacken, Heyden.
Spogostylum pluto Wied., Heyden.
Anthrax lateralis Say, Searchmont.
Laphria terrae-novae Macquart, Heyden.
Promachus bastardii Macquart, Heyden.
Physacephala furcillata Will., Oden, Michigan.
Echinomyia algens Wied., Sault Ste. Marie.
Echinomyia decisa Walker, Oden, Michigan.
Panzeria radicum Fabr., Oden, Michigan.
Phortica alboguttata Wahl. Searchmont.

SYRPHIDAE, by Dr. R. C. Osburn.

Syrphus ribesii (Linne). Heyden and Searchmont.
grossulariae Meigen. Heyden and Searchmont.
Sphaerophoria cylindrica (Say), Searchmont.
Sericomyia militaris Walker. Heyden and Searchmont.
Eristalis tenax (Linne). Searchmont.
meigenii Wiedemann. Soo.
bastardi Macquart. Oden, Mich.
flavipes Walker. Heyden and Searchmont, Oden, Mich.
transversus Wiedemann. Heyden.
Helophilus similis Macquart. Oden, Mich.
chrysostomus (Wiedemann). Oden, Mich.
conostomus Williston. Heyden.
Mallota cimbiciformis (Fallen). Heyden.
Temnostoma aequalis Loew. Heyden.

The above list of Syrphidae is a rather characteristic late summer list, and all the species are fairly common except the last which deserves some mention. *Temnostoma aequalis* has been recorded from three widely separated localities, the White Mountains, the English River of Hudson's Bay Terr. and Colorado,* but can by no means be considered a common species. In ten years of collecting in Ohio, N. Dakota, Br. Columbia, N. Y., and Mass., the writer has not met with it. The present record is

* In writing the above I overlooked the fact that the species has been recently recorded for Minnesota (by name only). Tenth Ann. Rep't State Entomologist of Minn., Dec., 1905, by F. L. Washburn.

interesting in being about intermediate in location to the previous records. The specimen, a female, is considerably brighter in coloration than Loew's and Williston's descriptions indicate, and there is no black on the hind femora as described by Loew "femoribus praeter apicem nigris" (Centur. V. 36). Otherwise the description applies closely.

COLEOPTERA.

The Coleoptera were sent to Mr. Chas. Dury of Cincinnati, who has furnished me with the following list:

Cicindela longilabris Say.
 vulgaris Say.
 var. *obliquata* Kby.
 hirticollis Say.
Gyrinus limbatus Say.
 dichrous Say.
 canadensis Reg.
Nechrophorus vespilloides Hbst.
Coccinella trifasciata Linn.
Buprestis fasciata Fabr.
 maculiventris Say.
Ellychnia corrusca Linn.
Leptura canadensis Fabr.
 proxima Say.
Monohammus confusor Kby.
 scutellatus Say.
Doryphora 10-lineata Say.
Chrysomela spirææ Say.
Adoxus vitis Linn.

The *Adoxus* are very small specimens of this species, otherwise the collection does not present any noteworthy features, unless it be to emphasize the fact, that Coleopterous insects are scarce in this region at this season of the year.

HYMENOPTERA.

The Hymenoptera were sent to Professor Jas. S. Hine who submits the following notes and list:

Three of the species have been determined by C. T. Brues of the Milwaukee Public Museum. Of a species of the family Evaniidae, taken at Searchmont, August 6th, he says that it is either *Gasteruption kreichbaumeri* Schletterer, described from Europe, or a new species. The following species besides the one mentioned were taken:

Urocerus albicornis Fabr., Heyden.
Homotropus pallipennis Prov., Searchmont.
Exoclium mundum Say, Oden, Michigan.
Exoclium fascipenne Norton, Searchmont.
Rhyssa albomaculata Cresson, Oden, Michigan.
Eumenes fraternus Say, Searchmont, Ontario.
Odynarus sp., Searchmont.
Pryonox atratus Lep., Heyden.
Bombus ternarius Say, Searchmont.

DRAGONFLIES.

As before stated almost my entire attention was given to dragonflies. A list of those taken follows:

1. **Calopteryx maculata** Beauv. Heyden, July 31st; outlet Stony Lake, August 4th; Searchmont, Aug. 1, 6, 7 and 9th. Altogether 9 males and 4 females. Much commoner than the next.

2. **Calopteryx aequabilis** Say. Heyden, July 31st and Aug. 3d; Searchmont, Aug. 1st. Four males and two females. More wary and swifter of flight than maculata.

3. **Lestes congener** Hagen. Searchmont, Aug. 7th; 4 males, 1 female, all taken in a small area of timothy growing in a bend of Perry Brook.

4. **Lestes uncatus** Kirby. Heyden, July 31st; Searchmont, Aug. 6th; 7 males and 3 females.

5. **Lestes disjunctus** Selys. Heyden, July 30th; Searchmont, Aug. 1, 6, 7 and 8th; Oden, Mich., Aug. 11th. Fifty males and four females were taken. Near Searchmont, along the railroad track, is a small marsh, grown up with a narrow, soft leaved sedge where this species was very abundant.

6. **Lestes rectangularis** Say. Sault Ste. Marie, July 29th; Oden, Michigan, Aug. 12th; three males.

7. **Chromagrion conditum** Hagen. Stony Lake, Aug. 3d and 4th. Six males and one female.

8. **Nehalennia irene** Hagen. Stony Lake, Aug. 3d. One male.

9. **Enallagma hageni** Walsh. Heyden and Stony Lake, July 30th and Aug. 3d and 4th. Eighteen males and one female.

Enallagma ebrium Hagen, Oden, Michigan, Aug. 11th. One male.

Enallagma carunculatum Morse. Oden, Mich., Aug. 11th and 13th. J. H. Williamson. Four males.

Enallagma exsulans Hagen. Oden, Mich. Aug. 13th. J. H. Williamson. Three males.

Enallagma signatum Hagen. Oden, Mich. Aug. 13th. J. H. Williamson. A pair.

10. **Ischnura verticalis** Say. Stony Lake, August 3d, Oden, Mich. Aug. 13th and 24th. J. H. Williamson. Two males and two females.

11. **Ophiogomphus carolus** Needham. Heyden, July 31st, Searchmont, Aug. 1, 6, 7 and 8th. Sixteen males and two females. Only two males were taken along Root River and but one or two more were seen there. The others were all taken along tributaries of the Goulais. A few were seen along the Goulais itself but were not taken. From its resting place on the leaves of the alder or from high in some tree this dragonfly makes fre-

quent but short visits to the rapids of the stream where its nymphal life was passed. With swift flight it drops from its sunlit leaf to a boulder, log or bit of smooth sand. It moves from one station to another by short flights, rendered invisible to the collector because of its swiftness and the agitated waters over which the insect passes. After a few moves it throws itself boldly into the water from which it arises to seek again its leafy and frequently lofty perch. When the late afternoon sun bathes with vertical rays a leafy wall of vegetation on the edge of some swift ripple where the crane flies are dancing in the spray, carolus forgets the heights of forest trees and catching its prey with ease, feeds and basks on a swaying leaf, from which it springs to flit the ripple and return again. The sun sinks lower, the forest shadow creeps across the ripple and up the alders, and the green mite of most animate nature rises with the shadow into the safe retreat of forest trees.

12. **Gomphus sordidus** Hagen. Heyden, July 31st, one female. Along Root River at different ripples on two occasions I saw males of a species of Gomphus which I thought was *brevis*. The abdomen was colored and held aloft exactly like this species. Also along Root River I saw close at hand a female Gomphus which I believe was *exilis*.

13. **Gomphus scudderi** Selys. Searchmont, Aug. 1, 6, 7, 8 and 9th. Fifty-two males; no females were seen; along the Goulais and its tributaries this was the commonest dragonfly. When resting on smooth sand, boulders or logs it is approached with difficulty; when resting on vegetation it may usually be taken with ease. It is a restless busy body, its flight swift but not well balanced or long sustained. One on occasion one flew swiftly toward me and alighted on my shoulder. A slight motion on my part caused it to take to sudden flight. On another occasion one alighted on the back of one hand. The other hand was brought slowly and carefully up and a fore and hind wing seized between thumb and finger. Several males of this species were distinctly seen at Oden, Mich., but were not captured.

Dromogomphus spinosus Selys. Oden Mich. Aug. 14th. J. H. Williamson. One male.

14. **Lanthus albistylus** Hagen. Searchmont, Aug. 8th; two males. This species was also distinctly seen at a ripple in Root River, but no specimens were taken there. The two taken were at the same ripple at Achigan Brook where one or two more were seen. No other specimens than these mentioned were seen during the trip.

15. **Hagenius brevistylus** Selys. Heyden, July 31st and Aug. 2d; Searchmont, Aug. 8th. Four males and one female. One male taken Aug. 8th was the only individual seen in the

Goulais drainage. Several were seen at Oden but none were captured there. The great bulk of this dragonfly and its peculiar flight, with its abdomen curved as though it would bring the center of gravity forward more nearly under the wing bases, are distinctive.

16. **Cordulegaster maculatus** Selys. Heyden, Aug. 2d; Searchmont, Aug. 1, 6 and 9th. Nine males and three females. These specimens are larger than others I have seen. At Heyden two females were taken and these were observed to fly down from trees alighting on algae covered rocks in the stream bed. On the portions of these rocks not covered with water they crawled about in an awkward, almost crippled, manner thrusting the abdomen with much commotion into the algae beneath the water. Males at Heyden alternated between the trees and short flights over the water. At Dam Creek, where six males were taken during the forenoon, the stretch of water patrolled was greater and the dragonflies were not interrupting their flight by frequently alighting in trees. The single female taken along Dam Creek alternated short flights with rests on low shrubs growing on the stream's banks. On July 31st another species of *Cordulegaster* was seen near a small much-shaded spring which discharged a small volume of water into the creek which I followed that day to its mouth in Root River.

17. **Boyeria vinosa** Say. Heyden, July 31st and Aug. 2d and 3d; Searchmont, Aug. 6, 7, 8 and 9th. Twenty-four males and one female. A common species along the streams where its tendency to examine critically every object projecting above the water often makes its capture an embarrassing matter to the collector. More than once as I waited for an approaching male that insect suddenly left the line of flight I had mapped out for it, flew to within an inch of my legs, circled around one leg a time or two, then about the other, then about both, and then quietly resumed its flight along the stream, oblivious to the net which had been frantically fanned all around it. Along Root River a portion of a fallen bridge lay in the stream forming a dark recess a few inches high, six or eight feet wide and possibly ten deep, over the water. One end of this recess ended in the bank, the only open side being directed toward mid-stream. I saw many *Boyerias* fly along the stream at this point and without exception all flew back into this recess, where they were completely concealed from the collector. Some of them remained within only a few seconds while others were there possibly a full half-minute. This species is more crepuscular than any other North American *Aeshnine* known to me.

18. **Boyeria grafiana** Williamson. Heyden, Aug. 2d; Searchmont, Aug. 6, 8 and 9th.

Note on Aeshnas. The main purpose of this collecting trip was to study the Aeshnas of the region in life. I believe that in the material collected by myself four species are represented. This belief is based however, largely on opinions formed in the field and not on study of the material after my return. This study will be made by Prof. E. M. Walker to whom I have sent my entire collection. Professor Walker's study will not be completed in the immediate future and for my purposes in this paper I have listed the species under four letters. Representatives of these four species, as I understand them, have been sent to Dr. Calvert for examination, and his notes on male abdominal appendages follow. But as I understand it, Dr. Calvert's opinions on these species are tentative, and the demands on his time permit no particular study of this matter now. So the question of the status of the four forms here indicated now rests with Professor Walker, to whom as stated, I have sent the entire lot.

Dorsal thoracic stripes short and narrow; lateral thoracic stripes divided each into two spots. Male anal triangle two-celled; appendages juncea type (intermediate between clepsydra, typical, and eremita—Dr. Calvert). Female appendages longer than the male, narrow, apex rounded. Aeshna W.

Dorsal thoracic stripes short and narrow; lateral thoracic stripes not divided; first lateral stripe wider below; size large. Male anal triangle two-celled; appendages juncea type (eremita form of appendages—Dr. Calvert). Female appendages about equal to male appendages, apex rounded. Aeshna X.

Dorsal thoracic stripes wide, reaching antealar sinus where they are widened; lateral thoracic stripes not divided; first lateral stripe wider below; size smaller than Aeshna X. Male anal triangle two-celled; appendages juncea type (clepsydra, typical, form of appendages—Dr. Calvert). Female appendages shorter, apex rounded. Aeshna Y.

Dorsal thoracic stripes wide, reaching antealar sinus where they are widened; lateral thoracic stripes not divided, about equal and uniform in width; abdomen with the blue spots greatly reduced in size. Male anal triangle three-celled; appendages cyanea type. Female appendages slightly longer than the male, apex rounded. This species has been widely listed as constricta. Aeshna Z.

19. **Aeshna W.** Heyden, July 30th and 31st, and Aug. 2, 3 and 4th. Searchmont, Aug. 6 and 9th. Eleven males and six females. On the afternoon and about sunset of Aug. 3d there were heavy showers of rain accompanied by thunder and lightning at Heyden. The yard of the shingle mill is devoid of all vegetation. Many shallow pools which disappeared before the next morning were formed in the yard. After sunset the rain ceased and almost at once dragonflies began to appear about

these pools. They were visible only when seen against the water and not always then. As long as sufficient light remained to catch glimpses of them they were still on the wing in apparently undiminished numbers. I succeeded in taking only eight specimens. One of these was *Boyeria vinosa*. The others were *Aeshnas*—W, Y, and Z. All eight were males.

20. **Aeshna X.** Heyden, July 30 and 31st, and Aug. 2d, 3d and 4th. Searchmont, Aug. 1 and 7th. Twenty-one males and four females. Most of this material was taken at Stony Lake. Only two specimens were taken at Searchmont. This was to be expected since, as stated above, all the collecting I did at lakes was done in the vicinity of Heyden, while at Searchmont rapid streams were followed, along whose courses *Aeshnas* and others, such as *Leucorhinas*, could be expected only as accidental visitors.

21. **Aeshna Y.** Heyden, July 30th, and Aug. 3d and 4th. Searchmont, Aug. 1 and 9th, Oden, Michigan, Aug. 11th and 12th, and Aug. 24th, (J. H. Williamson). Twenty-seven males and two females. Nineteen of these males were taken at Oden. *Aeshna X* was not seen at Oden at all. *Aeshna Y* was rare about Heyden, but, associated with a few *Aeshna Z*, it made up the entire *Aeshna* fauna, so far as I could determine, at Oden on the dates I was there.

22. **Aeshna Z.** Heyden, July 30th and Aug. 2, 3 and 4th. Searchmont, Aug. 6th; Oden, Michigan, Aug. 11th and 15th (J. H. Williamson). Twenty males and two females. This is the only *Aeshna* known to me which prefers woodland pools, quiet, grass-grown and much shaded streams, and early morning and late afternoon for its greatest activity. Of course it may be taken under other conditions but under these the most individuals are seen and taken. The species was the one usually taken along Root River. Two individuals were taken at Searchmont and three at Oden. Three females *Aeshnas* taken at Oden are not listed in the above discussion. These were taken Aug. 11th and Aug. 23d and Sept. 3d (J. H. Williamson).

23. **Somatochlora elongata** Scudder. Heyden, July 30th and 31st, and Aug. 2 and 3d. Seventeen males. When not hawking at a considerable elevation this species was readily taken. I believe the *Somatochloras* possibly enjoy a reputation for more powerful flight than they really possess. A wary dragonfly with just sufficient powers of flight to maintain itself in the air at an elevation beyond the reach of the collector would be difficult to capture. Moreover, if it were rare and seldom met with, the collector's anxiety to capture every specimen seen would tend to magnify his opinion of its powers. In the case of *S. elongata* the flight is not as sustained as that of the *Aeshnas*, it is less adept at dodging the collector's net, and it lacks the dash and mobility of

some of the Libellulines such as *Libellula incesta* and *Plathemis lydia*. Another species of *Somatochlora* was taken along Achigan Brook, but unfortunately it was broken into fragments by the ring of the insect net, rendering identification at the time impossible, and the fragments were subsequently lost.

Somatochlora williamsoni Walker. Oden, Michigan, Aug. 11th. Two males; I have in my collection a male of this species collected by M. K. Williamson at Oden, on Aug. 14, 1904.

24. ***Cordulia shurtleffi*** Scudder. Stony Lake, Aug. 3d. A single teneral male taken.

25. ***Dorocordulia libera*** Selys. Stony Lake, Aug. 3d, a single male which frequented a small area of water, floating logs and fallen tree tops.

26. ***Leucorhinia frigida*** Hagen. Stony Lake, Aug. 3d and 4th. Two males and two females. Associated with the next two species at Stony Lake. The three species were frequently found resting on all possible supports a short distance from the water and over the water a short distance from the shore, about the pond-like lower end of the lake. *Frigida* seemed to prefer, however, the dead twigs of fallen tree tops lying in the water some distance from the shore.

27. ***Leucorhinia proxima*** Calvert. Heyden, July 31st and Aug. 3d and 4th, Searchmont, Aug. 6th. Twenty males and fifteen females. All of these excepting three females, two taken July 31st and one Aug. 6th, were taken at Stony Lake. One of these males I at first thought represented another species, because of the following characters: the basal branch of the hamule is bent down on the hamule; the triangle of the front wing is followed by three cells, then three, then increasing; and the labium is varied with pale areas. The specimen was referred to Dr. Calvert who called my attention to Hagen's notes on the folding of the basal branch of the hamule (Syn. Od. Genus *Leucorhinia*, pp. 229-236, Trans. Am. Ent. Soc. XVII, July, 1890). Also a tabulation of venational characters of specimens in Dr. Calvert's collection shows that *proxima* has the triangle of the front wing followed by three rows of cells, increasing, or by three rows, then two, then increasing. Moreover, there is considerable variation in the color of the labium in this species.

28. ***Leucorhinia glacialis*** Hagen. Stony Lake, Aug. 3d and 4th. Five males. One male has the lower basal cell in both hind wings twice crossed.

29. ***Leucorhinia intacta*** Hagen. Sault Ste. Marie, Ontario, July 29th. One female.

30. ***Sympetrum obtrusum*** Hagen. Sault Ste. Marie, Ontario, July 29th and 30th. Heyden, July 30th and 31st and Aug. 3d. Searchmont, Aug. 1, 6 and 8th. Oden, Mich. Aug. 11th and 12th, and Aug. 14th and 26th (J. H. Williamson). Forty males and six

females were taken of this very abundant species. There is a disposition to regard rubicundulum and obtrusum as scarcely distinct. I have examined a great amount of material, covering practically the total range of the two and I have never seen a specimen which could not be referred certainly to one or the other on the basis of form of accessory genitalia of segment two. Moreover, the ivory white face of mature obtrusum is in striking contrast with the obscure face of rubicundulum. On the other hand I do not regard assimilatium as worthy of a name. At Stony Lake this species was very abundant, associated with the three species of Leucorhinia. What is the significance of the ivory face of the four?

31. *Sympetrum scoticum* Donovan. Sault Ste. Marie, Ontario, July 30th. A single female; others were seen but I had but a moment during a stop of the train.

32. *Libellula quadrimaculata* Linné. Stony Lake, August 3d, three males. This species was common at Stony Lake, resting on dead twigs over the water. It was seen at a number of places along the railroad track in the Upper Peninsula of Michigan.
